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W. W. L. Au

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13. ABSTRACT (Maximum 200 words)

The characteristics of echolocation signals used by the Atlantic bottlenose dolphin (*Tursiops truncatus*) and by the beluga or white whale (*Delphinapterus leucas*) in target detection and discrimination experiments in open waters will be discussed. Echolocation signals measured in open waters have been found to have considerably different properties than those measured in tanks. The primary reason for the differences in echolocation signals may be attributed to the use of very-low-intensity signals by animals in tanks and the use of higher-intensity (>40 dB) signals in open waters. Signals are projected in the forward direction along a narrow beam and echoes are detected by a receiving beam that overlaps the transmission beam. Acoustic properties of these signals, such as source sound-pressure levels, signal waveform, frequency spectrum, peak frequency, bandwidth, and click intervals, will be considered. The acoustic characteristics of echolocation signals propagating from the animal's head will also be discussed. The structure of the acoustic field directly forward of the animal, the transition region between the near and far acoustic fields, the directivity patterns in the vertical and horizontal planes, and off-axis distortion of signals will be addressed.

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